

Stainless Steel (General)

303

An austenitic stainless steel that has very good machinability but reduced formability. It is not recommended for any application involving welding and has a lower resistance to corrosion than 1.4301.

304

An austenitic stainless steel containing 18% chrome and 8% nickel. Excellent welding and forming properties with useful resistance to corrosion. (if welding use 304L). Machinability is reasonable.

316

An austenitic stainless steel with added molybdenum to improve corrosion resistance (better than 304) particularly in chloride environments. Use 316L for welding applications.

321

A variation of the basic austenitic stainless steel 1.4301 (304) with the addition of titanium as a stabiliser. It is resistant to inter-granular corrosion and can be easily welded and formed.

416

The addition of sulphur to this martensitic stainless steel gives it the best machining properties of any stainless steel. However, this comes at the cost of reduced corrosion resistance, formability and weldability.

430

A simple ferritic stainless steel with good corrosion resistance. Often used in chemical processing due to its particular resistance to nitric acid. Formability is good but it does not respond to heat treatment.

431

A heat treatable martensitic stainless steel that contains nickel. It has high tensile and torsional strength and is well suited to shaft manufacture. Welding is poor and it cannot be easily cold worked.

440C

Grade 440C is capable of attaining, after heat treatment, the highest strength, hardness and wear resistance of all the stainless alloys. Its very high carbon content is responsible for these characteristics, which make 440C particularly suited to such applications as ball bearings and valve parts.

13-8 PH

Precipitation hardening stainless steel bar. American aerospace grade, vacuum arc remelted (type XM-13). Very high strength/toughness with good corrosion resistance. For aircraft structural components and use in petrochemical industry.

15-5 PH

Precipitation hardening stainless steel bar. American aerospace grade, vacuum arc remelted or electro-slag refined (type XM-12). High strength/toughness with good corrosion resistance. For aircraft/missile construction, chemical process equipment and nuclear reactor components.

17-4 PH

Precipitation hardening stainless steel bar. American aerospace grade (type 630). High strength/toughness, good corrosion resistance and high fatigue resistance. For aerospace equipment and missile components. Commercial grade used in oil and gas.

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ThyssenKrupp Materials (UK)
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Aluminium Alloys

1050

An unalloyed non heat-treatable aluminium that is easily worked and has high resistance to corrosion.

C250

Manufactured from a 5083 type alloy & machined to industry standard thickness and flatness tolerances, polycoated both sides. Special casting & heat treatment techniques makes it extremely stress free whilst retaining 85-90% of the strength of rolled plate. Retaining flatness & dimensional tolerances after machining or even after repeated heating & cooling. C250 has excellent machining, welding & anodising properties.

2014A

High mechanical properties with good machinability. Finished components often need a protective coating to avoid corrosion.

2024

A high strength heat treatable alloy with excellent fatigue resistance. Workability is good and it can easily be machined to a high finish. Weldability is generally poor although it can be flash spot or seam welded.

2618

A strong aluminium alloy containing nominally 2% copper and 1.5% magnesium.

4032

Commonly used for manufacturing pistons with fairly good machinability. The alloy is weldable although gas welding should be avoided.

5083

A popular high strength aluminium alloy well suited to welding applications that require excellent corrosion resistance.

5251

A medium strength alloy with high corrosion resistance. This alloy is weldable and finds many applications in marine environments.

6063

A medium strength alloy commonly used for bespoke aluminium sections often in architectural and transport applications.

6082

A popular heat treatable alloy. Medium strength is combined with good anodising, welding, corrosion resistance and machinability.

7068

An alloy with the highest mechanical strength of all aluminium alloys and matching that of certain steels.

7020

A heat treatable alloy that age hardens naturally and therefore will recover properties in a heat affected zone after welding. Used in armoured vehicles, motorcycle and bicycle frames.

7075

A high strength and hardness alloy primarily used in aerospace applications. Good machinability but limited corrosion resistance.

L93

A high strength heat treatable alloy with good machinability. Cold formability can be limited when used fully heat treated as can weldability. Natural corrosion resistance is poor therefore a protective coating is often required.

L95

A high strength heat treatable aluminium alloy with excellent hardness properties. In the annealed condition this alloy can be flash spot welded and is easily formed. Often used in aerospace applications for highly stressed parts.

L111

A popular medium strength alloy with good corrosion resistance and good workability. In the annealed condition it can be easily welded and formed. Good anodising properties. Designed as a general purpose alloy it is suitable for many applications.

L163 / L164

A high strength 2014A alloy clad with 1050A to improve corrosion resistance. High mechanical properties with good machinability. L163:T3, L164:T4/T6.

L168

A high strength alloy containing 3.9% to 5% copper. High mechanical properties with good machinability. Finished components often need a protective coating to avoid corrosion. Cold formability can be limited when used fully heat treated, as can weldability.

Motorsport Specific Steels & Stainless Steels

AISI 4130

A chromium-molybdenum based heat treatable steel. Through hardenable easily machined. Tensile strength after heat treatment = 860 N/mm². Welded areas require heat treatment after welding to retain strength.

15CDV6

A chromium-molybdenum-vanadium heat treatable steel with high strength after heat treatment (1080-1280 N/mm²). Easily welded and does not require localised heat treatment after welding.

T45

A carbon-manganese steel with a tensile strength (Rm) of 700/900 N/mm². Finds many applications in motorsport and aerospace due to relatively high strength to weight ratio and reduced requirement for localised heat treatment after welding.

S80

A heat treatable chromium-nickel 431 type stainless steel in bar form. Has a high chromium content of around 15%. For use in aerospace and defence components subject to high stresses up to temperatures of around 400°C.

S132

A 3% Cr-Mo-V nitriding steel. Offers high strength and develops a hard wear resistant case after surface treatment. Generally available in bars and forgings for gearbox shafts and crankshafts.

S143

A precipitation hardening stainless steel with high mechanical strength and moderate to good corrosion resistance in a variety of media and is similar to that of basic 300 series stainless steels. Good machinability and weldability.

S98

A 2½% Nickel-Chromium-Molybdenum high carbon steel generally available in bars and forgings. Tensile strength (Rm) 1180-1420 N/mm².

S99

A 2½% Nickel-Chromium-Molybdenum high carbon steel generally available in bars and forgings. Tensile strength

S145

A precipitation hardening stainless steel with high strength and moderate to good corrosion resistance. Identical chemical composition as S143 and S144 but higher tensile strength than both achieved through heat treatment. (Rm) 1230-1420 N/mm².

S154

A 2½% Nickel-Chromium-Molybdenum steel generally available in bars and forgings. Tensile strength (Rm) 880-1080 N/mm².

S155

Ni-Cr-Mo-V (VAR). Steel bar and forgings. British Standard aerospace grade. Vacuum arc remelted, through hardenable steel. For aircraft, defence and Autosport components.

S156

A 4% Nickel-Chromium-Molybdenum case hardening steel generally available in bars and forgings. For aircraft engineering, defence and Autosport applications. A VAR version of S82.

S157

A Nickel-Chromium-Molybdenum case hardening steel. Often used for applications such as gears that require high core strength and toughness. Tensile strength 1180-1380 N/mm².

S162

Ultra high strength (1800 MPa). Good toughness and readily machinable in pre-aged condition. Excellent transverse properties. Main application is driveshafts.

S524

Austenitic chromium-nickel stainless steel stabilised with titanium. Available in hardened/tempered sheet and strip. Suitable for medium strength components requiring good corrosion resistance and cold workability. Good weldability. Tensile strength (Rm) 800-1100 N/mm².

S514

Carbon-manganese steel available in sheet and strip. Supplied heat treated to produce tensile strength (Rm) 770-100 N/mm².